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PATENT ABSTRACTS OF JAPAN

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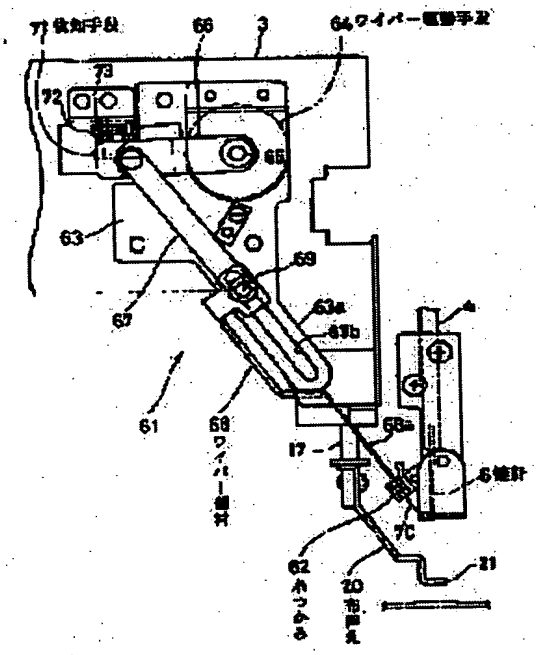
MORITA TETSUO

(54) SEWING MACHINE

(57)Abstract:

PURPOSE: To prevent a wiper member and sewing needle from being damaged even when a defective motion such as the wiper member does not return to the original position before the motion is generated by prohibiting the vertical motion of the sewing needle when the returning of the wiper member to the position before the motion is not detected by a detecting means.

CONSTITUTION: A wiper sensor 71 which is arranged on the left side of a rotary solenoid 64 of a sewing machine arm 3 detects that a wiper member 68 is located at a position before an operation, and outputs a detecting signal. When the wiper member 68 has not returned to the position before an operation for some reason, even when a command to resume a sewing operation is generated, a control unit prohibits the vertical motion of a sewing needle 6 until the detecting signal of that the wiper member 68 returns to the position before an operation is received from the wiper sensor 71. Also, the control unit prohibits a retracting motion of a cloth holder 20 to be lifted to the retracting position until the detecting signal of that the wiper member 68 returns to the position before an operation is received from the wiper sensor 71.



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CLAIMS

[Claim(s)]
[Claim 1] A sewing machine which is equipped with a wiper member drawn to a thread grip while performing sewing and paying an edge of said needle thread from cloth after thread-cutter actuation of a needle thread, moving up and down a sewing needle characterized by providing the following, and a wiper driving gear which drives this wiper member, and changes A detection means to detect having returned to a location before said wiper member operating An operation-control means to forbid vertical movement of said sewing needle when having returned to a location before said wiper member operating with this detection means is not detected
[Claim 2] It is the sewing machine according to claim 1 which is equipped with a cloth presser foot which is interlocked with vertical movement of said sewing needle, and moves up and down, and an evacuation driving means which raises this cloth presser foot to an evacuation location, and is characterized by for said operation-control means to forbid actuation of said evacuation driving means when having returned to a location before said wiper member operating with said detection means is not detected.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the sewing machine which is equipped with the wiper member drawn to a thread grip while paying the edge of a needle thread from cloth after thread-cutter actuation of a needle thread, and the wiper driving gear which drives this wiper member, and changes.
[0002]
[Description of the Prior Art] for example, the embroidery sewing machine which is this kind of sewing machine -- the back side of the sewing-machine arm section -- a wiper member -- slanting up down one -- a round trip -- while preparing movable, the rotary solenoid is prepared as a wiper driving gear which drives this wiper member. In this configuration, a needle thread is hooked on the hook section for thread guards which carried out the energization drive of the rotary solenoid, was made to move a wiper member to a slanting lower part, and was prepared in the point of this wiper member after thread-cutter actuation of a needle thread. and -- while return migration of the wiper member is carried out with a return spring to the slanting upper part, the hook section of a wiper member hooks a needle thread at this time and the cut edge of a needle thread will be paid by moving to the slanting upper part from cloth, if a rotary solenoid is ****(ed) after this -- up to a thread grip -- **** -- him -- it has composition by which ****** is carried out.
[0003]
[Problem(s) to be Solved by the Invention] However, after carrying out the energization drive of the rotary solenoid and operating a wiper member with a configuration conventionally [above-mentioned], When having not returned to the location before a wiper member operating by a certain cause (for example, it cannot return to the location before a wiper member operating when a poor thread cutter is generated and the needle thread is not cut) When sewing operation was resumed, the sewing needle and the needle bar collided with the wiper member which has not returned to the location before actuation, and there was a trouble that a wiper member or a sewing needle was damaged.
[0004] Moreover, while being constituted so that vertical movement of a sewing needle may be interlocked with and a cloth presser foot may be moved up and down, when choosing and exchanging needle bars, it consists of embroidery sewing machines so that the above-mentioned cloth presser foot may be raised to an evacuation location. In this case, as mentioned above, when it had not returned to the location before a wiper member operating by a certain cause and a cloth presser foot was raised to an evacuation location, this cloth presser foot collided with the wiper member, and the trouble that a wiper member or a cloth presser foot was damaged also had it.
[0005] Then, the purpose of this invention is to offer the sewing machine which can prevent certainly that a wiper member and a sewing needle are damaged, even if the malfunction which does not return to the location before a wiper member operating by a certain cause occurs, after operating a wiper member. Moreover, other purposes of this invention are in a sewing machine equipped with the cloth presser foot which is interlocked with vertical movement of a sewing needle and moves up and down to offer the sewing machine which can prevent certainly damage on a wiper member and a cloth presser foot at the

time of the malfunction of a wiper member.
[0006]
[Means for Solving the Problem] A wiper member drawn to a thread grip while a sewing machine of this invention performs sewing, moving a sewing needle up and down and paying an edge of said needle thread from cloth after thread-cutter actuation of a needle thread, In a sewing machine which is equipped with a wiper driving gear which drives this wiper member, and changes It has a detection means to detect having returned to a location before said wiper member operating, and when having returned to a location before said wiper member operating with this detection means is not detected, it has the feature at a place equipped with an operation-control means to forbid vertical movement of said sewing needle.
[0007] Moreover, while having a cloth presser foot which is interlocked with vertical movement of said sewing needle, and moves up and down, it has an evacuation driving means which raises this cloth presser foot to an evacuation location, and when having returned to a location before said wiper member operating with said detection means is not detected further, controlling to forbid actuation of said evacuation driving means with said operation-control means is also considered.
[0008]
[Function] Since it considered as the configuration which forbids vertical movement of a sewing needle when a detection means did not detect having returned to the location before a wiper member operating according to the above-mentioned means, even if the malfunction which does not return to the location before a wiper member operating by a certain cause occurs, it can prevent certainly that a sewing needle and a needle bar will not collide with a wiper member, and a wiper member and a sewing needle are damaged.
[0009] moreover, in the sewing machine equipped with the cloth presser foot which is interlocked with vertical movement of a sewing needle and moves up and down, when a detection means does not detect having returned to the location before a wiper member operating Since it considered as the configuration which forbids actuation of the evacuation driving means which raises a cloth presser foot to an evacuation location Even if the malfunction which does not return to the location before a wiper member operating by a certain cause occurs, it can prevent certainly that a cloth presser foot will not collide with a wiper member, and a wiper member and a cloth presser foot are damaged.
[0010]
[Example] It explains referring to a drawing hereafter about one example which applied this invention to the embroidery sewing machine. First, in drawing 3 which shows the whole embroidery sewing-machine configuration, on the sewing-machine table 2, the main part 1 of a sewing machine has the sewing-machine arm section 3 in one, and is constituted. The needle-bar support case 5 equipped with six needle bars 4 is formed in the point of this sewing-machine arm section 3 in this case two or more.
[0011] Six above-mentioned needle bars 4 are supported respectively possible [vertical movement] together with the direction of width (before or after) in the needle-bar support case 5, and the sewing needle 6 is attached in the lower limit section which projects from the needle-bar support case 5 to a lower part, respectively. Thread sources of supply which are not illustrated are consisted of by each sewing needle 6 so that the embroidery thread (not shown) which is a needle thread which is [class / a color,] different may be supplied.
[0012] Moreover, the needle-bar support case 5 is attached in the sewing-machine arm section 3 movable to a cross direction (the direction of a list of a needle bar 4), and a migration drive is carried out by the needle-bar selection motor 7. And in the sewing-machine arm section 3, the drive for transmitting the rotation driving force of the sewing-machine motor 8 to a needle bar 4, and moving it up and down is formed. This driving force is constituted, as transmitted only to the needle bar 4 located in the predetermined operating location and alternatively driven in one [4] of six needle bars 4.
[0013] On the other hand, in the sewing-machine table 2, it is located in the lower part part of a needle bar 4, the sewing-machine base section 9 is formed, and the iron pot (not shown) which is the **** prehension machine which forms an embroidery blind stitch in the processing cloth 11 supported by the embroidery frame 10 by collaboration with a sewing needle 6 is arranged in this sewing-machine base section 9. Synchronizing with vertical movement of a sewing needle 6, the rotation drive of this iron pot

is carried out by the sewing-machine motor 8. Moreover, a throat plate, needle-thread cutting equipment, etc. are formed above the above-mentioned iron pot. Furthermore, the horizontal migration device 12 for carrying out the migration drive of the above-mentioned embroidery frame 10 free to X shaft orientations (cross direction) and Y shaft orientations (longitudinal direction) is formed in the sewing-machine table 2.

[0014] This horizontal migration device 12 consists of a Y shaft-orientations migration frame 14 by which a migration drive is carried out by the Y-axis delivery motor 13 (refer to drawing 8) to Y shaft orientations, and an X shaft-orientations migration frame 16 by which a migration drive is carried out by the X-axis delivery motor 15 (refer to drawing 8) to X shaft orientations.

[0015] Now, as shown in drawing 4 , the cloth pressure bar 17 is formed in the point of the sewing-machine arm section 3 possible [vertical movement]. In this case, the cloth pressure bar 17 has composition bearing of the vertical movement of is made possible by making a lower limit side insert in through tube section 19a in which it was prepared by the lower side wall section 19 of the sewing-machine arm section 3 while making the supporter 18 of the shape of a cylinder in which that upper limit side was prepared in the upper part in the sewing-machine arm section 3 fit in. As shown also in drawing 5 , the cloth presser foot 20 ****s in the lower limit section of the above-mentioned cloth pressure bar 17, and it is attached in it by the stop. The cloth presser-foot section 21 which has the through tube in which said sewing needle 6 is made to insert is formed in the lower limit of this cloth presser foot 20.

[0016] Moreover, the cloth pressure bar guide bracket 22 ****s in the pars intermedia of the cloth pressure bar 17, and it is fixed to it by the stop. And the cloth presser-foot agonist 23 which is moving-part material relates at least to the pars intermedia of the above-mentioned cloth pressure bar 17, and is prepared possible [vertical movement]. The cloth presser-foot agonist 23 is making the shape of a longwise rectangle frame, and specifically, it is constituted so that the inferior-surface-of-tongue section of said cloth pressure bar guide bracket 22 may be made to contact the upper surface section of low wall section 23b through O ring 24, while making the cloth pressure bar 17 insert in in the through tube formed in the upper wall section 23a and low wall section 23b, respectively.

[0017] And the 1st compression coil spring 25 is formed between upper wall section 23a of the cloth presser-foot agonist 23, and the upper surface section of the cloth pressure bar guide bracket 22. In the usual state, this 1st compression coil spring 25 is energized so that the inferior-surface-of-tongue section of the cloth pressure bar guide bracket 22 may contact low wall section 23b of the cloth presser-foot agonist 23. Lower limit section 26a of the cloth presser-foot actuation link 26 is connected with side wall section 23c by the side of drawing 4 Nakamigi of the above-mentioned cloth presser-foot agonist 23 rotatable. As shown also in drawing 5 , end section 27a of the cloth presser-foot driving link 27 which makes the shape of about L characters is connected with upper limit section 26b of this cloth presser-foot actuation link 26 rotatable. This cloth presser-foot driving link 27 is supported rotatable around it by using a shaft 28 as the supporting point at the sewing-machine arm section 3. The movement transducer material 29 consists of an above-mentioned cloth presser-foot actuation link 26 and a cloth presser-foot driving link 27.

[0018] On the other hand, the main shaft 30 by which a rotation drive is carried out by the sewing-machine motor 8 is arranged in the upper part in the sewing-machine arm section 3, and anchoring immobilization is carried out so that the cloth presser-foot drive cam 31 may rotate to the point of this main shaft 30 at one. As shown in drawing 5 , while cam-groove 31a for a cloth presser foot for driving the cloth presser foot 20 is formed in right-hand side, cam-groove 31b for balances for driving a balance (not shown) is formed in left-hand side at the peripheral face section of the above-mentioned cloth presser-foot drive cam 31.

[0019] Here, into cam-groove 31a for a cloth presser foot, fitting connection of the cam follower 32 prepared in other end 27b of said cloth presser-foot driving link 27 is carried out. Thereby, the movement transducer material 29 26, i.e., a cloth presser-foot actuation link, and the cloth presser-foot driving link 27 are connected between the cloth presser-foot agonist 23 and cam-groove 31a for a cloth presser foot of the cloth presser-foot drive cam 31. Moreover, the 2nd compression coil spring 34 is

formed between the up side wall section 33 of the sewing-machine arm section 3, and upper wall section 23a of the cloth presser-foot agonist 23.
[0020] This 2nd compression coil spring 34 has the strong spring force rather than the spring force of 1st compression coil spring 25, by energizing the cloth presser-foot agonist 23 below, carries out rotation energization of the cloth presser-foot driving link 27 in the direction of the left-handed rotation in drawing 5 , and is energizing that cam follower 32 in the usual state in the direction adjacent to the cam side (inside of the left-hand side in drawing 5 in this case) of cam-groove 31a.
[0021] If the rotation drive of the cloth presser-foot drive cam 31 is carried out in this configuration, while a cam follower 32 contacts the cam side of cam-groove 31a, according to the configuration of this cam side, it will move to right and left, and the cloth presser-foot driving link 27 will rock a shaft 28 as the rotation supporting point. And rocking of this cloth presser-foot driving link 27 is transmitted to the cloth presser-foot agonist 23 through the cloth presser-foot actuation link 26, and when this cloth presser-foot agonist 23 moves up and down, the cloth pressure bar 17 and the cloth presser foot 20 have composition which carries out both-way migration in the vertical direction between the best locations shown in the lowest location shown in drawing 5 , and drawing 6 .
[0022] Moreover, as shown in drawing 6 and drawing 7 , evacuation slot 31c is prepared in the opposite side of the cam side of cam-groove 31a of the above-mentioned cloth presser-foot drive cam 31. When the cloth presser foot 20 and the cloth pressure bar 17 are located in the best location shown in drawing 6 , a cam follower 32 moves in the direction of drawing 6 Nakamigi, and the location of this evacuation slot 31c is set as a location whose evacuation into evacuation slot 31a is attained, as shown in drawing 7 .
[0023] On the other hand, the rotary solenoid 36 which is an evacuation driving means is arranged in the right face section of the drawing 4 Nakamigi side wall section 35 of the sewing-machine arm section 3. The axis of rotation 37 of this rotary solenoid 36 is projected into the sewing-machine arm section 3, and the cloth presser-foot evacuation lever 38 is connected with that point. Bending formation of the piece section of engagement 38a is carried out to the lower limit section of this cloth presser-foot evacuation lever 38 to the left in drawing 4 at the right angle. In this case, in order to make it go up to the evacuation location which shows the cloth presser foot 20 to drawing 7 , after making it located in the best location which shows the cloth presser foot 20 and the cloth pressure bar 17 to drawing 6 , the rotary solenoid 36 is driven and the cloth presser-foot evacuation lever 38 is rotated in the direction of the left-handed rotation in drawing 6 . Thereby, piece section of engagement 38a of the cloth presser-foot evacuation lever 38 contacts press section 27c (refer to drawing 4) formed in the other end 27b side of the cloth presser-foot driving link 27, and pushes this press section 27c on the method of drawing 6 Nakamigi. Consequently, as the cloth presser-foot driving link 27 uses a shaft 28 as the rotation supporting point, it rotates in the direction of right-handed rotation and it is shown in drawing 7 , into evacuation slot 31c, it is evacuated, a cam follower 32 has close, and it has the composition that the cloth presser foot 20 and the cloth pressure bar 17 go up to an evacuation location.
[0024] Now, thread payment equipment 61 as shown in drawing 1 is arranged by the left lateral in drawing 3 of the point of the sewing-machine arm section 3. This thread payment equipment 61 is equipment for leading to the thread grip 62 while paying that cut edge of a needle thread from cloth after thread-cutter actuation of a needle thread, after performing sewing operation. The above-mentioned thread payment equipment 61 is explained concretely below. Attachment immobilization of the support plate 63 of thread payment equipment 61 is carried out, and the rotary solenoid 64 which is a wiper driving gear is attached in this support plate 63 at the left lateral in drawing 3 of the point of the sewing-machine arm section 3. It is formed in the lower part of the above-mentioned support plate 63 so that guide section 63a may be prolonged in a slanting lower part, and long hole-like guide slot 63b is formed in this guide section 63a.
[0025] Moreover, the end section of a lever 66 is connected with the axis of rotation 65 of the above-mentioned rotary solenoid 64, and the upper limit section of the connection member 67 is connected with the other end of this lever 66 rotatable. The wiper member 68 ****s, and it binds tight in the lower limit section of the connection member 67 by 69, and is fixed to it, and this screw thread 69 has fitted in

in guide slot 63b of a support plate 63. Hook member 68a is attached in the lower limit section of the above-mentioned wiper member 68, and hook section 68b for hooking and catching thread to the point of this hook member 68a, as shown in drawing 10 is formed in it.

[0026] If the energization drive of the rotary solenoid 64 is carried out in this configuration, the axis of rotation 65 and a lever 66 will rotate in the direction of the left-handed rotation in drawing 1 , and as the connection member 67 and the wiper member 68 are guided at guide slot 63b and it is shown in drawing 2 , it will move to a slanting lower part. Thereby, hook section 68b of hook member 68a of the wiper member 68 hooks the needle thread prolonged from **** of a sewing needle 6 to a cloth side. Then, if the rotary solenoid 64 is ****(ed), the axis of rotation 65 and a lever 66 rotate in the direction of the circumference of drawing 2 Nakamigi according to the spring force of the return spring built in the rotary solenoid 64, and the connection member 67 and the wiper member 68 will be guided at guide slot 63b, will move to the slanting upper part, and will return to the location before actuation (refer to drawing 1). By this, while hook section 68a of the wiper member 68 hooks a needle thread, it leads to the hauling thread grip 62 upwards, and as shown in drawing 1 , the cut edge 70 of a needle thread is grasped by the thread grip 62.

[0027] Here, the wiper sensor 71 which is a detection means is arranged in the left in drawing 1 of the rotary solenoid 64 in the sewing-machine arm section 3 (refer to drawing 2). In this case, the wiper sensor 71 consists of photosensors, such as a photo coupler, and is attached in the sewing-machine arm section 3 through the substrate 72 and the tie-down plate 73. The other end of a lever 66 detects being located in the location shown in drawing 1 , i.e., located in the location before the wiper member 68 operating, and the above-mentioned wiper sensor 71 is constituted so that a detection signal may be outputted.

[0028] Moreover, in drawing 8 which shows the electric configuration of an embroidery sewing machine, the control unit 39 which consists of a microcomputer etc. controls operation of embroidery sewing at large, it consists of buses 43 which connect these to CPU40, ROM41 and RAM42, and a list, and the input interface 44 and the output interface 45 are further connected to the above-mentioned bus 43. This control unit 39 constitutes the operation-control means. Moreover, the operation-control program is memorized in the above ROM 41, and various kinds of data, such as embroidery data for performing embroidery sewing, is memorized in the above RAM 42.

[0029] Furthermore, the motorised circuits 46-49 for driving the sewing-machine motor 8, the X-axis delivery motor 15, the Y-axis delivery motor 13, and the needle-bar selection motor 7, respectively are connected to the output interface 45, and when CPU40 carries out drive control of each above-mentioned motor based on the operation-control program in ROM41, the embroidery data in RAM42, etc., embroidery sewing actuation to the processing cloth 11 is performed. Moreover, the solenoid drive circuits 53 and 74 which drive the rotary solenoids 36 and 64 in the display drive circuit 52 which drives the display 51 for displaying an embroidery graphic form and various kinds of messages, and a list are connected to the output interface 45.

[0030] On the other hand, the keyboard 55 which comes to have various input keys, such as the external storage 54 which consists of a floppy disk for memorizing embroidery data etc., and a start key, the angle-of-rotation sensor 56 which detects angle of rotation of a main shaft 30, and the wiper sensor 71 are connected to the input interface 44. The above-mentioned angle-of-rotation sensor 56 consists of rotary encoders etc., detects angle of rotation (angle of rotation which makes the top dead center of a needle bar 4 a zero (0 degree)) of a main shaft 30, and has composition which outputs the angle-of-rotation detecting signal corresponding to angle of rotation.

[0031] Next, drawing 9 is also explained with reference to an operation of the above-mentioned configuration. First, at the time of sewing operation of embroidery sewing of usual, if the energization drive of the sewing-machine motor 8 is carried out and a main shaft 30 rotates, a needle bar 4 and a sewing needle 6 will drive in the vertical direction. In this case, in drawing 9 , Curve A shows the locus of vertical movement of a sewing needle 6. And vertical movement of the above-mentioned sewing needle 6 is interlocked with, and the cloth presser foot 20 moves up and down. If a main shaft 30 rotates and the rotation drive of the cloth presser-foot drive cam 31 is specifically carried out, while a cam

follower 32 contacts the cam side of cam-groove 31a, according to the configuration of this cam side, it will move to right and left, and the cloth presser-foot driving link 27 will rock a shaft 28 as the rotation supporting point, and the cloth presser-foot agonist 23 will move up and down. Consequently, the cloth pressure bar 17 and the cloth presser foot 20 move up and down between the location shown in drawing 5 , and the location shown in drawing 6 . In drawing 9 , Curve B shows the locus of vertical movement of this cloth presser foot 20. In addition, in drawing 9 , Curve C shows balance **** and Curve D shows ******. Moreover, in drawing 9 , 0 degree of needle-bar top dead centers is shown, and 180 degrees of needle-bar bottom dead points are shown.

[0032] And as described above, when the cloth pressure bar 17 moves up and down, while it is energized by the 1st compression coil spring 25 and the inferior-surface-of-tongue section of the cloth pressure bar guide bracket 22 contacts to low wall section 23b of the cloth presser-foot agonist 23, it is energized by the 2nd compression coil spring 34, and the cam follower 32 of the cloth presser-foot driving link 27 contacts the cam side of cam-groove 31a for a cloth presser foot of the cloth presser-foot drive cam 31. In this case, while the 1st compression coil spring 25 takes out ********, it becomes the spring of the dedication for permitting the actuation in which the cloth presser foot 20 appears on the stage of cloth. On the other hand, while the 2nd compression coil spring 34 which has the strong spring force turns into a spring of the dedication for making the cam follower 32 of the cloth presser-foot driving link 27 contact to the cam side of cam-groove 31a of the cloth presser-foot drive cam 31 from the spring force of the 1st compression coil spring 25, the cloth presser foot 20 serves as a spring of the dedication for permitting the actuation to an evacuation location going up.

[0033] now -- while the cut edge of a needle thread will be paid from cloth by thread payment equipment 61 if cutting of a needle thread is performed by needle-thread cutting equipment while a **** halt of the sewing-machine motor 8 is carried out after necessary sewing operation is performed then -- up to the thread grip 62 -- **** -- him -- ****** is carried out. A sewing needle 6 is in the condition (condition shown in drawing 1) of being located in a top dead center, as the energization drive of the rotary solenoid 64 is carried out, a lever 66 rotates in the direction of the left-handed rotation in drawing 1 and it is shown in drawing 2 , the wiper member 68 moves to a slanting lower part, and, specifically, the needle thread to which hook section 68b extends from **** of a sewing needle 6 to a cloth side is hooked. Then, if the rotary solenoid 64 is ****(ed), a lever 66 will rotate in the direction of the circumference of drawing 2 Nakamigi according to the spring force of a return spring, the wiper member 68 will move to the slanting upper part, and it will return to the location before the actuation shown in drawing 1 . Since it pulls upwards and leads to the thread grip 62, hooking the needle thread from which hook section 68b of the wiper member 68 was cut at this time, as shown in drawing 1 , the edge 70 of a needle thread comes to be grasped by the thread grip 62.

[0034] Now, when having not returned by a certain cause to the location (location shown in drawing 1) before the wiper member 68 operating (for example, it cannot return to the location before the wiper member 68 operating when a poor thread cutter is generated and the needle thread is not cut) Even if the command which resumes sewing operation occurs, a control unit 39 It has the composition which forbids vertical movement of a sewing needle 6, i.e., the configuration of forbidding sewing operation (energization drive of the sewing-machine motor 8), until it receives the detection signal which detected having returned to the location before the wiper member 68 operating from the wiper sensor 71.

[0035] Moreover, a control unit 39 has the composition which forbids the evacuation actuation which raises the cloth presser foot 20 to an evacuation location, i.e., the configuration of forbidding the energization drive of the rotary solenoid 36, until it receives the detection signal which detected having returned to the location before the wiper member 68 operating from the wiper sensor 71. Incidentally, in the condition that the wiper member 68 is operating, if the cloth presser foot 20 is moved to an evacuation location (refer to drawing 7) (in the condition of having not returned to the location before actuation), as shown in drawing 2 , the cloth presser foot 20 will collide with the wiper member 68.

[0036] According to this example of such a configuration, when the wiper sensor 71 does not detect having returned to the location before the wiper member 68 operating Since it considered as the configuration which forbids vertical movement of a sewing needle 6, even if the malfunction which does

not return to the location before the wiper member 68 operating by a certain cause occurs, it can prevent certainly that a sewing needle 6 and a needle bar 4 will not collide with the wiper member 68, and the wiper member 68 and a sewing needle 6 are damaged. Moreover, since it considered as the configuration which forbids the energization drive of the rotary solenoid 36 for raising the cloth presser foot 20 to an evacuation location when the wiper sensor 71 did not detect having returned to the location before the wiper member 68 operating, even if the malfunction of the wiper member 68 occurs, it can prevent certainly that the cloth presser foot 20 will not collide with the wiper member 68, and the wiper member 68 and the cloth presser foot 20 are damaged.

[0037] In addition, although the above-mentioned example constituted the wiper sensor 71 from the photosensor, it is not restricted to this and, of course, you may constitute from a microswitch, a magnetometric sensor, etc.

[0038]

[Effect of the Invention] Even if the malfunction which does not return to the location before a wiper member operating occurs since this invention considered as the configuration which forbids vertical movement of a sewing needle when a detection means did not detect having returned to the location before a wiper member operating so that clearly from the above explanation, the outstanding effect that it can prevent certainly that a sewing needle and a needle bar will not collide with a wiper member, and a wiper member and a sewing needle are damaged does so. Moreover, since it considered as the configuration which forbids actuation of the evacuation driving means which raises a cloth presser foot to an evacuation location when a detection means did not detect having returned to the location before a wiper member operating, even if the malfunction which does not return to the location before a wiper member operating occurs, it can prevent certainly that a cloth presser foot will not collide with a wiper member, and a wiper member and a cloth presser foot are damaged.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Rear view of the thread payment equipment circumference showing one example of this invention
[Drawing 2] The drawing 1 equivalent drawing showing the condition that the wiper member operated
[Drawing 3] The perspective diagram of the whole sewing machine
[Drawing 4] The vertical section side elevation of the sewing-machine arm section
[Drawing 5] Front view showing the drive of a cloth presser foot and a cloth pressure bar
[Drawing 6] The drawing 5 equivalent drawing showing the condition that the cloth presser foot moved to the best location
[Drawing 7] The drawing 5 equivalent drawing showing the condition that the cloth presser foot went up to the evacuation location
[Drawing 8] Block diagram
[Drawing 9] Drawing showing the locus of vertical movement of a sewing needle and a cloth presser foot
[Drawing 10] The partial plan of a wiper member
[Description of Notations]
In the main part of a sewing machine, and 3, the sewing-machine arm section and 4 a sewing needle and 8 for a needle bar and 6 A sewing-machine motor, [1] In 9, the sewing-machine base section and 10 a processing cloth and 12 for an embroidery frame and 11 A horizontal migration device, In 17, a cloth pressure bar and 20 movement transducer material and 30 for a cloth presser foot and 29 A main shaft, A cloth presser-foot drive cam and 36 31 A rotary solenoid (evacuation driving means), 39 -- a control unit (operation-control means) and 61 -- thread payment equipment and 64 -- a rotary solenoid (wiper driving gear) and 66 -- in a lever and 67, a hook member and 68b show the hook section, and, as for a connection member and 68, 71 shows a wiper sensor (detection means), as for a wiper member and 68a.

[Translation done.]

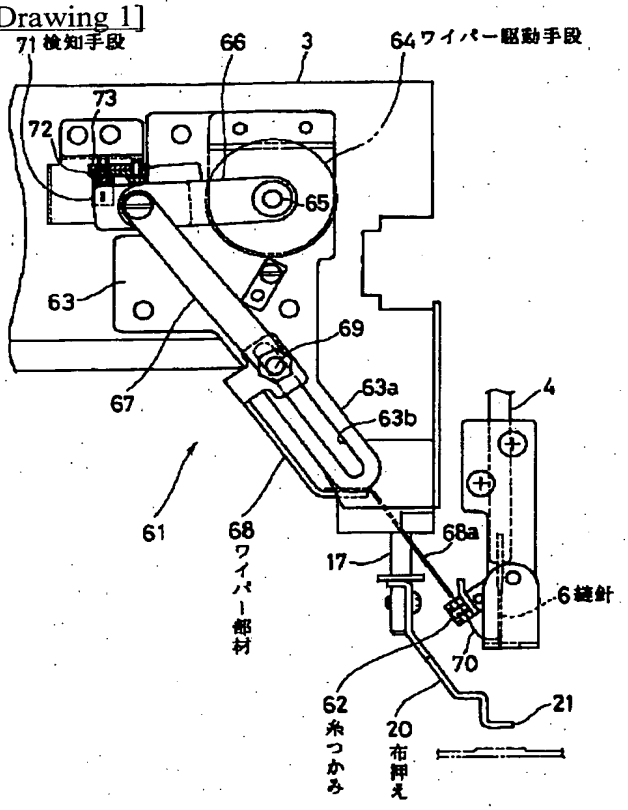
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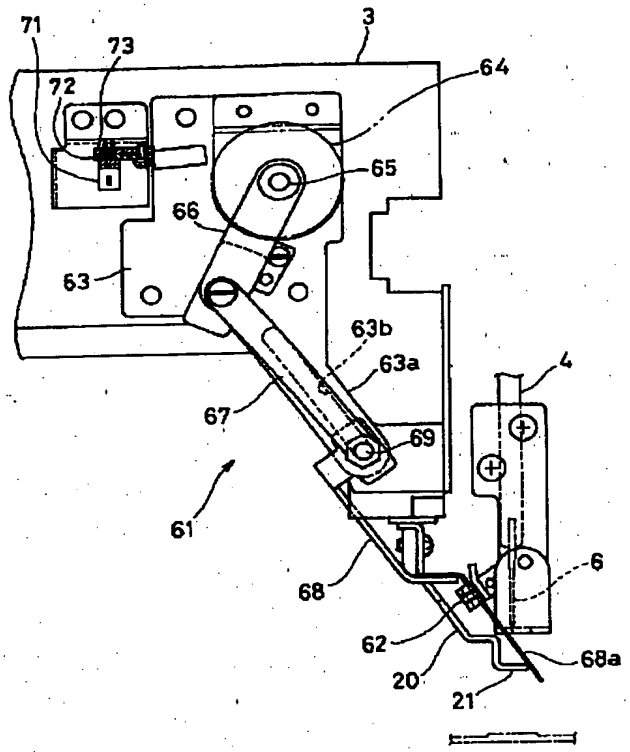
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

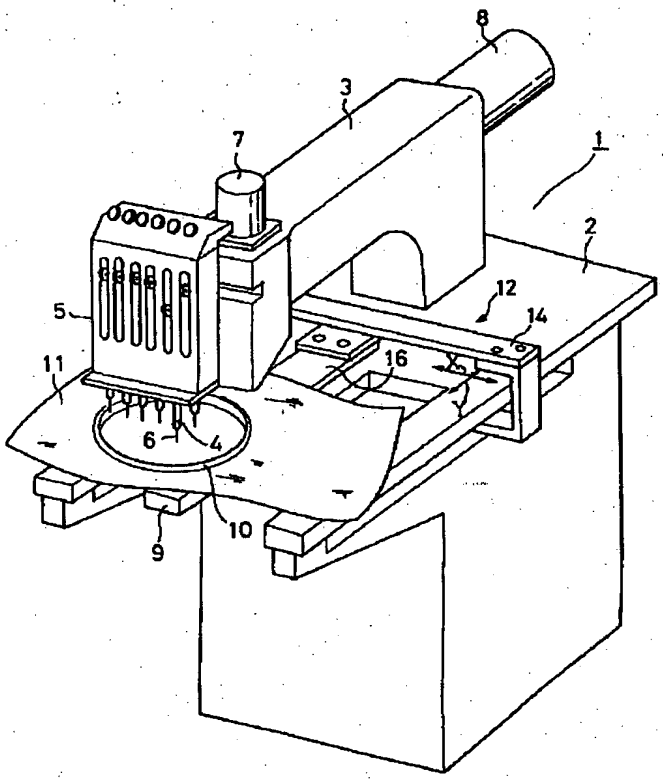
[Drawing 1]



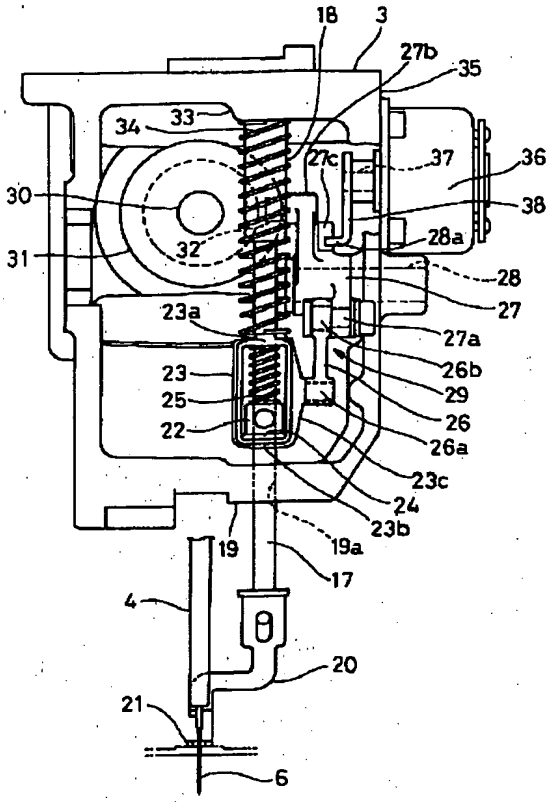
[Drawing 2]



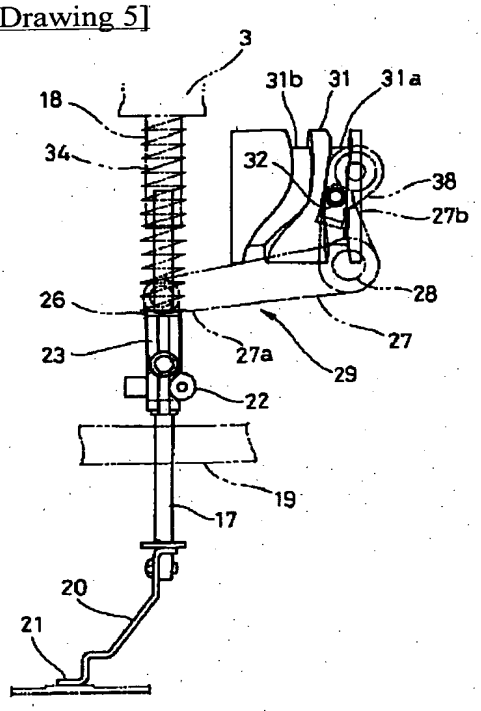
[Drawing 3]



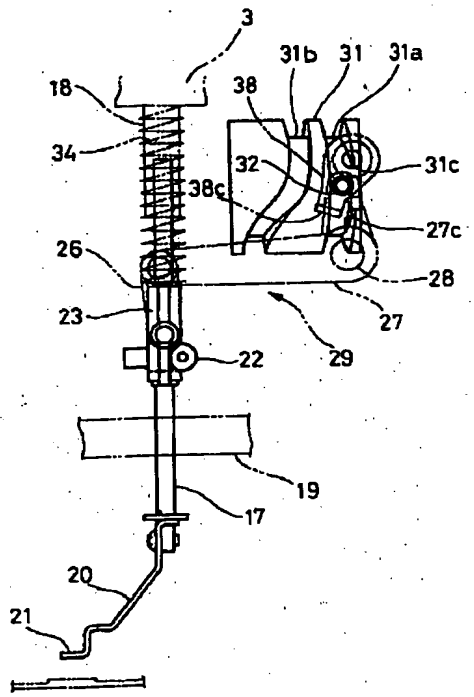
[Drawing 4]



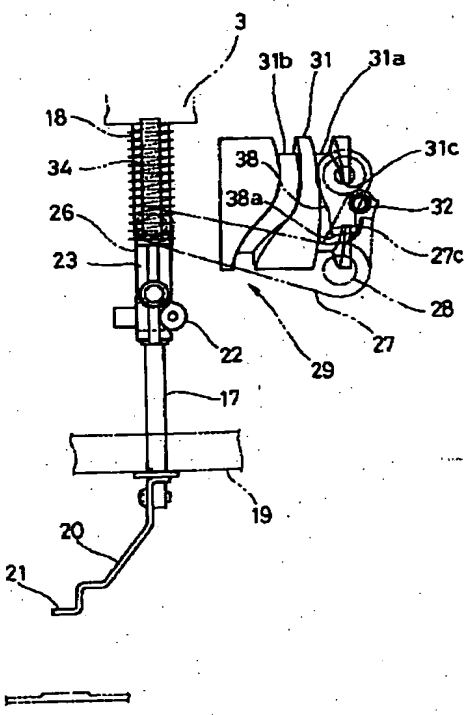
[Drawing 5]



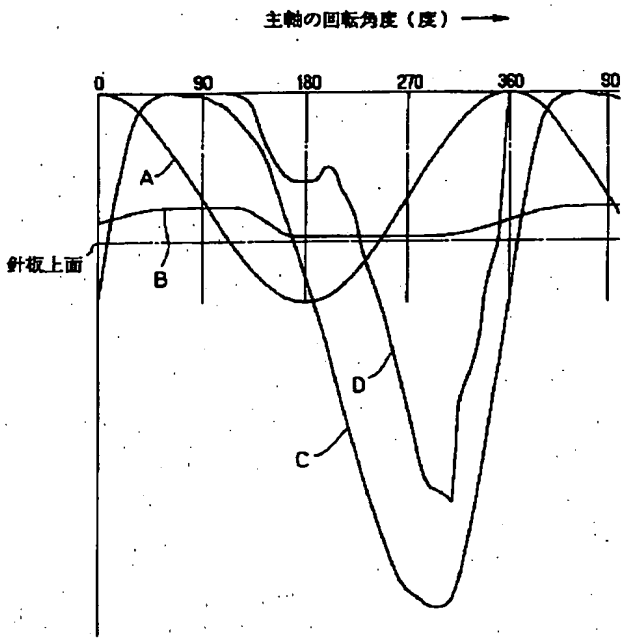
[Drawing 6]



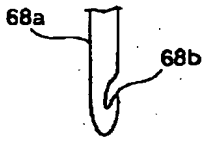
[Drawing 7]



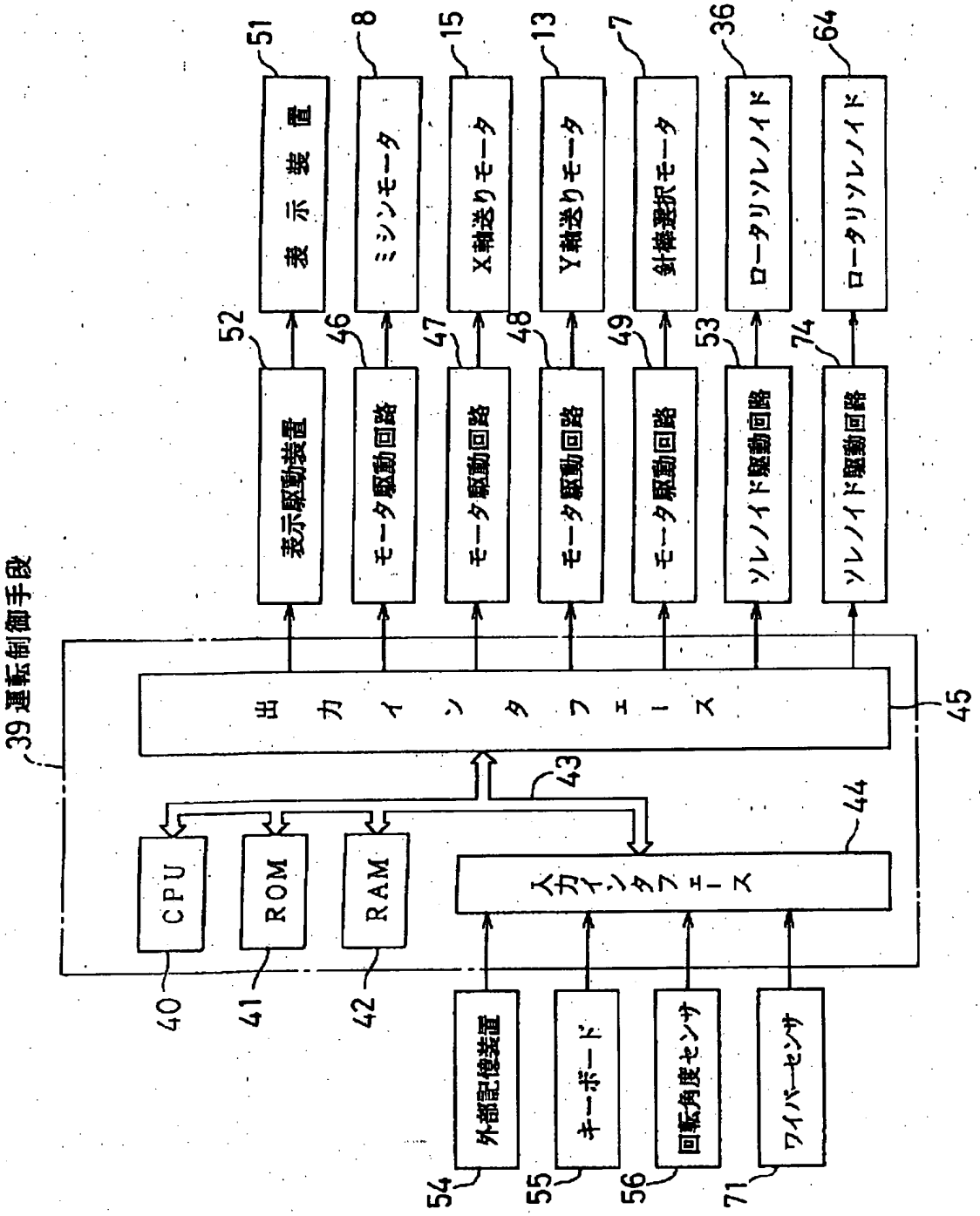
[Drawing 9]



[Drawing 10]



[Drawing 8]



[Translation done.]

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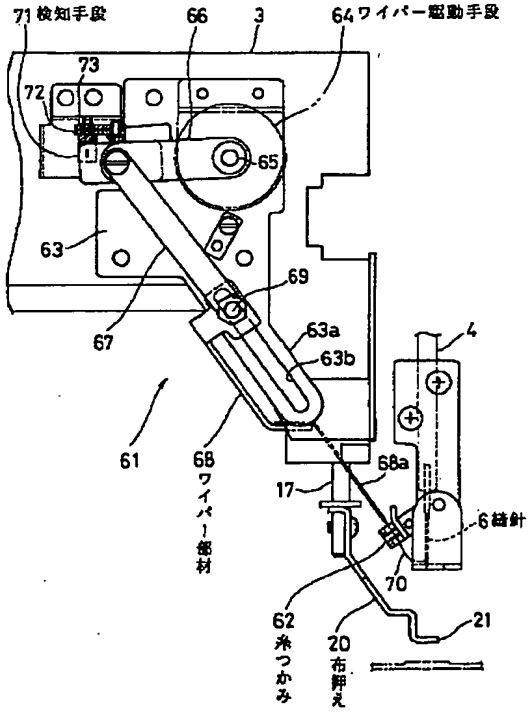
(74)代理人　弁理士　佐藤　強　（外１名）

(54)【発明の名称】　ミシン

(57)【要約】

【目的】　本発明は、ワイパー部材を作動させた後、何らかの原因でワイパー部材が作動前の原位置まで復帰しない動作不良が発生しても、ワイパー部材及び縫針の損傷を確実に防止できるミシンを提供することにある。

【構成】　本発明は、正常な状態においては、ワイパー部材が作動前の原位置に戻ったことを検知手段が検知するが、もしも、何らかの原因でワイパー部材が作動前の原位置に復帰しない動作不良が発生した場合、縫針の上下動を禁止するようにしたものである。



1

【特許請求の範囲】

【請求項1】　縫針を上下動させながら縫製を実行するものであって、上糸の糸切り動作後に前記上糸の端部を布から払うと共に糸つかみまで導くワイパー部材と、このワイパー部材を駆動するワイパー駆動装置とを備えて成るミシンにおいて、

前記ワイパー部材が作動前の位置に戻ったことを検知する検知手段と、

この検知手段により前記ワイパー部材が作動前の位置に戻ったことが検知されないときには、前記縫針の上下動を禁止する運転制御手段とを備えたことを特徴とするミシン。

【請求項2】　前記縫針の上下動に連動して上下動される布押えと、

この布押えを退避位置まで上昇させる退避駆動手段とを備え、

前記運転制御手段は、前記検知手段により前記ワイパー部材が作動前の位置に戻ったことが検知されないときには、前記退避駆動手段の動作を禁止するようにしたことを特徴とする請求項1記載のミシン。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、上糸の糸切り動作後に上糸の端部を布から払うと共に糸つかみまで導くワイパー部材と、このワイパー部材を駆動するワイパー駆動装置とを備えて成るミシンに関する。

【0002】

【従来の技術】この種のミシンである例えば刺繍ミシンでは、ミシンアーム部の背面側にワイパー部材を斜め上下方向に往復移動可能に設けると共に、このワイパー部材を駆動するワイパー駆動装置としてロータリソレノイドを設けている。この構成の場合、上糸の糸切り動作後に、ロータリソレノイドを通電駆動して、ワイパー部材を斜め下方へ移動させて該ワイパー部材の先端部に設けられた糸掛け用のフック部に上糸を引っ掛ける。そして、この後、ロータリソレノイドを断電すると、復帰ばねによりワイパー部材が斜め上方へ復帰移動され、このとき、ワイパー部材のフック部が上糸を引っ掛けながら斜め上方へ移動することから、切断された上糸の端部が布から払われると共に糸つかみまで導びかれて保持される構成となっている。

【0003】

【発明が解決しようとする課題】しかしながら、上記従来構成では、ロータリソレノイドを通電駆動してワイパー部材を作動させた後、何らかの原因でワイパー部材が作動前の位置まで復帰していない（例えば糸切り不良が発生して上糸が切断されていない場合にはワイパー部材が作動前の位置まで復帰することができない）ときに、縫製運転を再開すると、作動前位置に復帰していないワイパー部材に縫針及び針棒が衝突して、ワイパー部材または縫針が損傷するという問題点があった。

2

【0004】また、刺繍ミシンでは、縫針の上下動に連動して布押えを上下動させるように構成されていると共に、針棒を選択して交換する時等に上記布押えを退避位置まで上昇させるように構成されている。この場合、上述したように何らかの原因でワイパー部材が作動前の位置まで復帰していないと、布押えを退避位置へ上昇させる際に、該布押えがワイパー部材に衝突して、ワイパー部材または布押えが損傷するという問題点もあった。

【0005】そこで、本発明の目的は、ワイパー部材を作動させた後、何らかの原因でワイパー部材が作動前の位置まで復帰しない動作不良が発生しても、ワイパー部材及び縫針が損傷することを確実に防止できるミシンを提供するにある。また、本発明の他の目的は、縫針の上下動に連動して上下動される布押えを備えているミシンにおいて、ワイパー部材の動作不良時に、ワイパー部材及び布押えの損傷を確実に防止することができるミシンを提供するにある。

【0006】

【課題を解決するための手段】本発明のミシンは、縫針を上下動させながら縫製を実行するものであって、上糸の糸切り動作後に前記上糸の端部を布から払うと共に糸つかみまで導くワイパー部材と、このワイパー部材を駆動するワイパー駆動装置とを備えて成るミシンにおいて、前記ワイパー部材が作動前の位置に戻ったことを検知する検知手段を備え、この検知手段により前記ワイパー部材が作動前の位置に戻ったことが検知されないときには前記縫針の上下動を禁止する運転制御手段を備えたところに特徴を有する。

【0007】また、前記縫針の上下動に連動して上下動される布押えを備えると共に、この布押えを退避位置まで上昇させる退避駆動手段を備え、更に、前記検知手段により前記ワイパー部材が作動前の位置に戻ったことが検知されないときには前記運転制御手段によって前記退避駆動手段の動作を禁止するように制御することも考えられる。

【0008】

【作用】上記手段によれば、ワイパー部材が作動前の位置に戻ったことを検知手段が検知しないときには、縫針の上下動を禁止する構成としたので、何らかの原因でワイパー部材が作動前の位置まで復帰しない動作不良が発生しても、ワイパー部材に縫針及び針棒が衝突しなくなり、ワイパー部材及び縫針が損傷することを確実に防止できる。

【0009】また、縫針の上下動に連動して上下動される布押えを備えたミシンにおいて、ワイパー部材が作動前の位置に戻ったことを検知手段が検知しないときには、布押えを退避位置まで上昇させる退避駆動手段の動作を禁止する構成としたので、何らかの原因でワイパー部材が作動前の位置まで復帰しない動作不良が発生して

も、ワイパー部材に布押えが衝突しなくなり、ワイパー部材及び布押えが損傷することを確実に防止できる。

【００１０】

【実施例】以下、本発明を刺繍ミシンに適用した一実施例について図面を参照しながら説明する。まず、刺繍ミシンの全体構成を示す図３において、ミシン本体１は、ミシンテーブル２上にミシンアーム部３を一体的に有して構成されている。このミシンアーム部３の先端部には、複数本この場合例えば６本の針棒４を備えた針棒支持ケース５が設けられている。

【００１１】上記６本の針棒４は、針棒支持ケース５内に横（前後）方向に並んでそれぞれ上下動可能に支持されており、針棒支持ケース５から下方へ突出する下端部には、それぞれ縫針６が取付けられている。各縫針６には、図示しない糸供給源から、色や種類等の異なる上糸である刺繍糸（図示しない）が供給されるように構成されている。

【００１２】また、針棒支持ケース５は、ミシンアーム部３に前後方向（針棒４の並び方向）へ移動可能に取付けられ、針棒選択モータ７により移動駆動されるようになっている。そして、ミシンアーム部３内には、ミシンモータ８の回転駆動力を針棒４に伝達して上下動させるための駆動機構が設けられている。この駆動力は、所定の使用位置に位置された針棒４にのみ伝達されるようになっており、６本の針棒４のうちの一つの針棒４だけが選択的に駆動されるように構成されている。

【００１３】一方、ミシンテーブル２には、針棒４の下方部位に位置してミシンベッド部９が設けられ、このミシンベッド部９内には、縫針６との協働により刺繍枠１０に支持された加工布１１に刺繍縫目を形成する糸輪捕捉器である例えば釜（図示しない）が配設されている。この釜は、ミシンモータ８により縫針６の上下動に同期して回転駆動されるようになっている。また、上記釜の上方には、針板や上糸切断装置等が設けられている。更に、ミシンテーブル２には、上記刺繍枠１０をＸ軸方向（前後方向）及びＹ軸方向（左右方向）へ自在に移動駆動させるための水平移動機構１２が設けられている。

【００１４】この水平移動機構１２は、Ｙ軸送りモータ１３（図８参照）によりＹ軸方向へ移動駆動されるＹ軸方向移動枠１４と、Ｘ軸送りモータ１５（図８参照）によりＸ軸方向へ移動駆動されるＸ軸方向移動枠１６とから構成されている。

【００１５】さて、ミシンアーム部３の先端部には、図４に示すように、布押え棒１７が上下動可能に設けられている。この場合、布押え棒１７は、その上端側をミシンアーム部３内上部に設けられた円筒状の支持部１８に嵌合させると共に、下端側をミシンアーム部３の下部側壁部１９に設けられた貫通孔部１９ａに挿通させることにより、上下動可能に支承される構成となっている。上記布押え棒１７の下端部には、図５にも示すように、布押え２０がねじ止めにより取付けられている。この布押え２０の下端には、前記縫針６を挿通させる貫通孔を有する布押え部２１が形成されている。

【００１６】また、布押え棒１７の中間部位には、布押え棒抱き２２がねじ止めにより固定されている。そして、可動部材である例えば布押え作動体２３が、上記布押え棒１７の中間部位に関連して上下動可能に設けられている。具体的には、布押え作動体２３は、縦長の矩形枠状をなしており、その上壁部２３ａ及び下壁部２３ｂにそれぞれ形成された貫通孔内に布押え棒１７を挿通させると共に、下壁部２３ｂの上面部に前記布押え棒抱き２２の下面部をＯリング２４を介して当接させるように構成されている。

【００１７】そして、布押え作動体２３の上壁部２３ａと布押え棒抱き２２の上面部との間には、第１の圧縮コイルばね２５が設けられている。この第１の圧縮コイルばね２５は、常には布押え棒抱き２２の下面部が布押え作動体２３の下壁部２３ｂに当接するように付勢している。上記布押え作動体２３の図４中右側の側壁部２３ｃには、布押え作動リンク２６の下端部２６ａが回動可能に連結されている。この布押え作動リンク２６の上端部２６ｂには、図５にも示すように、ほぼＬ字状をなす布押え駆動リンク２７の一端部２７ａが回動可能に連結されている。この布押え駆動リンク２７は、ミシンアーム部３に軸２８を支点としてその回りに回動可能に支持されている。上記布押え作動リンク２６と布押え駆動リンク２７とから、運動変換部材２９が構成されている。

【００１８】一方、ミシンアーム部３内の上部には、ミシンモータ８により回動駆動される主軸３０が配設されており、この主軸３０の先端部に、布押え駆動カム３１が一体に回動するように取付け固定されている。上記布押え駆動カム３１の外周面部には、図５に示すように、右側に布押え２０を駆動するための布押え用カム溝３１ａが形成されていると共に、左側に天秤（図示しない）を駆動するための天秤用カム溝３１ｂが形成されている。

【００１９】ここで、布押え用カム溝３１ａ内には、前記布押え駆動リンク２７の他端部２７ｂに設けられたカムフォロワ３２が嵌合連結されている。これにより、運動変換部材２９即ち布押え作動リンク２６及び布押え駆動リンク２７が、布押え作動体２３と布押え駆動カム３１の布押え用カム溝３１ａとの間に連結されている。また、ミシンアーム部３の上部側壁部３３と、布押え作動体２３の上壁部２３ａとの間には、第２の圧縮コイルばね３４が設けられている。

【００２０】この第２の圧縮コイルばね３４は、第１の圧縮コイルばね２５のばね力よりも強いばね力を有しており、布押え作動体２３を下方へ付勢することにより、布押え駆動リンク２７を図５中左回り方向へ回動付勢し、そのカムフォロワ３２を常にはカム溝３１ａのカム

5

面（この場合、図5中左側の内面）に当接する方向へ付勢している。

【0021】この構成の場合、布押え駆動カム31が回動駆動されると、カムフォロワ32がカム溝31aのカム面に当接しながら該カム面の形状に応じて左右に移動して、布押え駆動リンク27が軸28を回動支点として揺動する。そして、この布押え駆動リンク27の揺動が布押え作動リンク26を介して布押え作動体23へ伝達されて、該布押え作動体23が上下動することにより、布押え棒17及び布押え20が図5に示す最下位置と図6に示す最上位置との間で上下方向に往復移動する構成となっている。

【0022】また、上記布押え駆動カム31のカム溝31aのカム面の反対側には、図6及び図7に示すように、退避溝31cが設けられている。この退避溝31cの位置は、布押え20及び布押え棒17が図6に示す最上位置に位置しているときに、カムフォロワ32が図6中右方向へ移動して、図7に示すように、退避溝31a内へ退避可能になるような位置に設定されている。

【0023】一方、ミシンアーム部3の図4中右側壁部35の右面部には、退避駆動手段である例えばロータリソレノイド36が配設されている。このロータリソレノイド36の回転軸37は、ミシンアーム部3内へ突出しており、その先端部に布押え退避レバー38が連結されている。この布押え退避レバー38の下端部には、係合片部38aが図4中左方に直角に折曲形成されている。この場合、布押え20を図7に示す退避位置まで上昇させるには、布押え20及び布押え棒17を図6に示す最上位置に位置させた後、ロータリソレノイド36を駆動して、布押え退避レバー38を図6中左回り方向へ回動させる。これにより、布押え退避レバー38の係合片部38aが、布押え駆動リンク27の他端部27b側に形成された押圧部27c（図4参照）に当接して、該押圧部27cを図6中右方へ押す。この結果、布押え駆動リンク27が軸28を回動支点として右回り方向へ回動し、図7に示すように、カムフォロワ32が退避溝31c内へ入って退避され、もって、布押え20及び布押え棒17が退避位置まで上昇する構成となっている。

【0024】さて、ミシンアーム部3の先端部の図3中左側面には、図1に示すような糸払い装置61が配設されている。この糸払い装置61は、縫製運転を行った後、上糸の糸切り動作後に、その切断された上糸の端部を布から払うと共に、糸つかみ62まで導くための装置である。上記糸払い装置61について、以下具体的に説明する。ミシンアーム部3の先端部の図3中左側面には、糸払い装置61の支持板63が取付固定されており、この支持板63にワイパー駆動装置である例えばロータリソレノイド64が取付けられている。上記支持板63の下部には、ガイド部63aが斜め下方に延びるように形成されており、このガイド部63aに長孔状のガイド溝63bが形成されている。

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【0025】また、上記ロータリソレノイド64の回転軸65には、レバー66の一端部が連結され、このレバー66の他端部に連結部材67の上端部が回動可能に連結されている。連結部材67の下端部には、ワイパー部材68がねじ69により締め付け固定されており、該ねじ69が支持板63のガイド溝63b内に嵌合されている。上記ワイパー部材68の下端部には、フック部材68aが取付けられており、このフック部材68aの先端部に、図10に示すように、糸を引っ掛けて捕捉するためのフック部68bが形成されている。

【0026】この構成の場合、ロータリソレノイド64が通電駆動されると、回転軸65及びレバー66が図1中左回り方向へ回転して、連結部材67及びワイパー部材68がガイド溝63bに案内されて図2に示すように斜め下方へ移動する。これにより、ワイパー部材68のフック部材68aのフック部68bが縫針6の目孔から布側へ延びる上糸を引っ掛ける。この後、ロータリソレノイド64が断電されると、ロータリソレノイド64に内蔵された復帰ばねのばね力により回転軸65及びレバー66が図2中右回り方向へ回転されて、連結部材67及びワイパー部材68がガイド溝63bに案内されて斜め上方へ移動して、作動前の位置に復帰する（図1参照）。これにより、ワイパー部材68のフック部68aが上糸を引っ掛けながら上方へ引っ張り糸つかみ62まで導き、図1に示すように、切断された上糸の端部70が糸つかみ62によって把持される。

【0027】ここで、ミシンアーム部3におけるロータリソレノイド64の図1中左方には、検知手段であるワイパーセンサ71が配設されている（図2参照）。この場合、ワイパーセンサ71は、例えばフォトカプラ等の光センサから構成されており、基板72及び取付板73を介してミシンアーム部3に取付けられている。上記ワイパーセンサ71は、レバー66の他端部が図1に示す位置に位置していること、即ち、ワイパー部材68が作動前の位置に位置していることを検知して、検知信号を出力するように構成されている。

【0028】また、刺繍ミシンの電気的構成を示す図8において、マイクロコンピュータ等からなる制御装置39は、刺繍縫いの運転全般を制御するものであり、CPU40、ROM41及びRAM42、並びに、これらを接続するバス43から構成されており、上記バス43には更に入力インターフェース44及び出力インターフェース45が接続されている。この制御装置39が、運転制御手段を構成している。また、上記ROM41内には運転制御プログラムが記憶されており、上記RAM42内には刺繍縫いを行うための刺繍データ等の各種のデータが記憶されている。

【0029】更に、出力インターフェース45には、ミシンモータ8、X軸送りモータ15、Y軸送りモータ1

3、針棒選択モータ７をそれぞれ駆動するためのモータ駆動回路４６～４９が接続されており、ＣＰＵ４０がＲＯＭ４１内の運転制御プログラム及びＲＡＭ４２内の刺繍データ等に基づいて上記各モータを駆動制御することにより、加工布１１に対する刺繍縫い動作が実行されるようになっている。また、出力インターフェース４５には、刺繍図形や各種のメッセージを表示するための表示装置５１を駆動する表示駆動回路５２、並びに、ロータリソレノイド３６及び６４を駆動するソレノイド駆動回路５３及び７４が接続されている。

【００３０】一方、入力インターフェース４４には、刺繍データ等を記憶するためのフロッピーディスク等からなる外部記憶装置５４、スタートキー等の各種入力キーを備えてなるキーボード５５、主軸３０の回転角度を検出する回転角度センサ５６及びワイパーセンサ７１が接続されている。上記回転角度センサ５６は、例えばロータリエンコーダ等から構成されており、主軸３０の回転角度（針棒４の上死点を原点（０°）とする回転角度）を検出して、回転角度に対応する回転角度検出信号を出力する構成となっている。

【００３１】次に、上記構成の作用を図９も参照して説明する。まず、通常の刺繍縫いの縫製運転時には、ミシンモータ８が通電駆動されて主軸３０が回動されると、針棒４及び縫針６が上下方向へ駆動される。この場合、縫針６の上下動の軌跡を、図９において、曲線Ａで示す。そして、上記縫針６の上下動に連動して布押え２０が上下動する。具体的には、主軸３０が回動して布押え駆動カム３１が回動駆動されると、カムフォロワ３２がカム溝３１ａのカム面に当接しながら該カム面の形状に応じて左右に移動し、布押え駆動リンク２７が軸２８を回動支点として揺動し、布押え作動体２３が上下動する。この結果、布押え棒１７及び布押え２０が図５に示す位置と図６に示す位置との間で上下動する。この布押え２０の上下動の軌跡を、図９において、曲線Ｂで示す。尚、図９において、曲線Ｃは天秤糸量を示し、曲線Ｄは釜糸量を示している。また、図９において、０°は針棒上死点を示し、１８０°は針棒下死点を示している。

【００３２】そして、上記したように布押え棒１７が上下動するとき、第１の圧縮コイルばね２５により付勢されて布押え棒抱き２２の下面部が布押え作動体２３の下壁部２３ｂへ当接すると共に、第２の圧縮コイルばね３４により付勢されて布押え駆動リンク２７のカムフォロワ３２が布押え駆動カム３１の布押え用カム溝３１ａのカム面に当接する。この場合、第１の圧縮コイルばね２５が、布押え圧を出すと共に、布押え２０が布の段の上に載る動作を許容するための専用のばねとなる。一方、第１の圧縮コイルばね２５のばね力よりも強いばね力を有する第２の圧縮コイルばね３４が、布押え駆動リンク２７のカムフォロワ３２を布押え駆動カム３１のカム溝

３１ａのカム面へ当接させるための専用のばねとなると共に、布押え２０が退避位置への上昇する動作を許容するための専用のばねとなる。

【００３３】さて、所要の縫製運転が実行された後、ミシンモータ８が断電停止されると共に、上糸切断装置により上糸の切断が行われると、続いて、糸払い装置６１によって、切断された上糸の端部が布から払われると共に、糸つかみ６２まで導びかれて把持される。具体的には、縫針６が上死点に位置している状態（図１に示す状態）で、ロータリソレノイド６４が通電駆動されて、レバー６６が図１中左回り方向へ回転して、図２に示すように、ワイパー部材６８が斜め下方へ移動し、フック部６８ｂが縫針６の目孔から布側へ延びる上糸を引っ掛ける。この後、ロータリソレノイド６４が断電されると、復帰ばねのばね力によりレバー６６が図２中右回り方向へ回転されて、ワイパー部材６８が斜め上方へ移動して、図１に示す作動前の位置に復帰する。このとき、ワイパー部材６８のフック部６８ｂが切断された上糸を引っ掛けながら上方へ引っ張って糸つかみ６２まで導くことから、図１に示すように、上糸の端部７０が糸つかみ６２によって把持されるようになる。

【００３４】さて、何らかの原因でワイパー部材６８が作動前の位置（図１に示す位置）まで復帰していない（例えば糸切り不良が発生して上糸が切断されていない場合にはワイパー部材６８が作動前の位置まで復帰することができない）ときに、縫製運転を再開する指令が発生しても、制御装置３９は、ワイパーセンサ７１からワイパー部材６８が作動前の位置に復帰していることを検知した検知信号を受けるまで、縫針６の上下動を禁止する構成、即ち、縫製運転（ミシンモータ８の通電駆動）を禁止する構成となっている。

【００３５】また、制御装置３９は、ワイパーセンサ７１からワイパー部材６８が作動前の位置に復帰していることを検知した検知信号を受けるまで、布押え２０を退避位置まで上昇させる退避動作を禁止する構成、即ち、ロータリソレノイド３６の通電駆動を禁止する構成となっている。ちなみに、ワイパー部材６８が作動している状態で（作動前の位置に戻っていない状態で）、布押え２０を退避位置（図７参照）へ移動させると、図２に示すように、ワイパー部材６８に布押え２０が衝突してしまう。

【００３６】このような構成の本実施例によれば、ワイパー部材６８が作動前の位置に戻ったことをワイパーセンサ７１が検知しないときには、縫針６の上下動を禁止する構成としたので、何らかの原因でワイパー部材６８が作動前の位置まで復帰しない動作不良が発生しても、ワイパー部材６８に縫針６及び針棒４が衝突しなくなり、ワイパー部材６８及び縫針６が損傷することを確実に防止できる。また、ワイパー部材６８が作動前の位置に戻ったことをワイパーセンサ７１が検知しないときに

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は、布押え２０を退避位置まで上昇させるためのロータリソレノイド３６の通電駆動を禁止する構成としたので、ワイパー部材６８の動作不良が発生しても、ワイパー部材６８に布押え２０が衝突しなくなり、ワイパー部材６８及び布押え２０が損傷することを確実に防止できる。

【００３７】尚、上記実施例では、ワイパーセンサ７１を光センサから構成したが、これに限られるものではなく、例えばマイクロスイッチや磁気センサ等から構成しても良いことは勿論である。

【００３８】

【発明の効果】本発明は以上の説明から明らかなように、ワイパー部材が作動前の位置に戻ったことを検知手段が検知しないときには、縫針の上下動を禁止する構成としたので、ワイパー部材が作動前の位置まで復帰しない動作不良が発生しても、ワイパー部材に縫針及び針棒が衝突しなくなり、ワイパー部材及び縫針が損傷することを確実に防止できるという優れた効果を奏する。また、ワイパー部材が作動前の位置に戻ったことを検知手段が検知しないときには、布押えを退避位置まで上昇させる退避駆動手段の動作を禁止する構成としたので、ワイパー部材が作動前の位置まで復帰しない動作不良が発生しても、ワイパー部材に布押えが衝突しなくなり、ワイパー部材及び布押えが損傷することを確実に防止できる。

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【図面の簡単な説明】

【図１】本発明の一実施例を示す糸払い装置周辺の背面図

【図２】ワイパー部材が作動した状態を示す図１相当図

【図３】ミシン全体の斜視図

【図４】ミシンアーム部の縦断側面図

【図５】布押え及び布押え棒の駆動機構を示す正面図

【図６】布押えが最上位置に移動した状態を示す図５相当図

【図７】布押えが退避位置へ上昇した状態を示す図５相当図

【図８】ブロック図

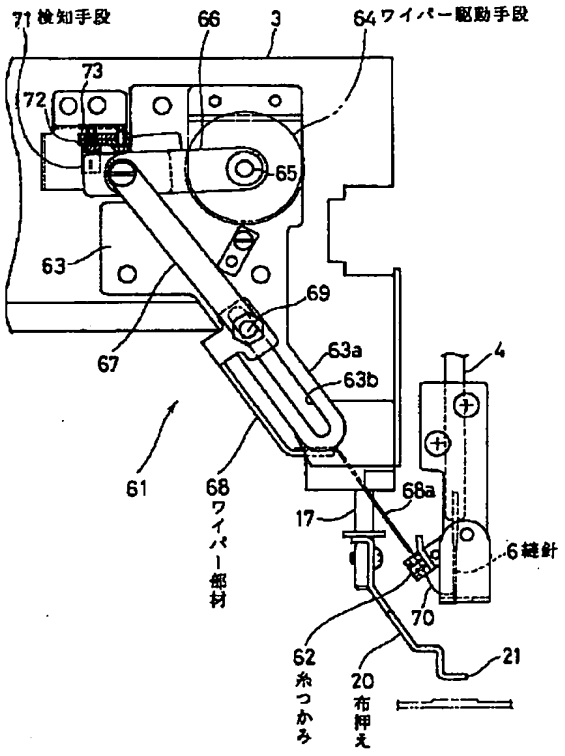
【図９】縫針及び布押えの上下動の軌跡を示す図

【図１０】ワイパー部材の部分上面図

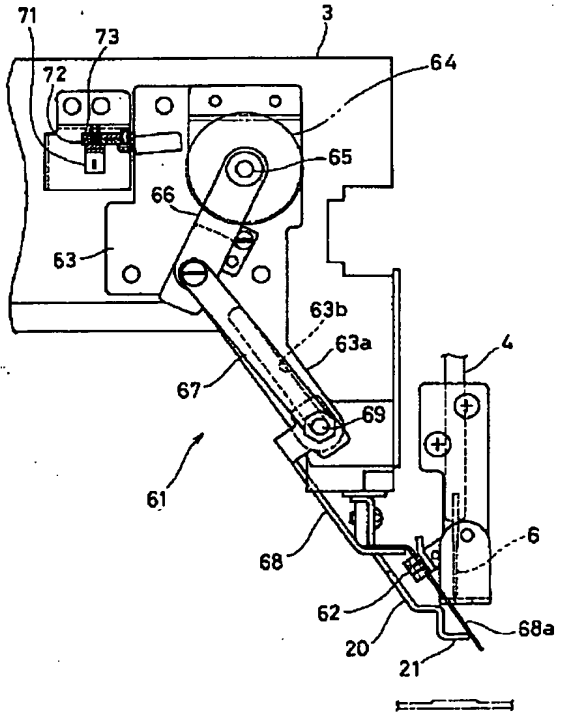
【符号の説明】

１はミシン本体、３はミシンアーム部、４は針棒、６は縫針、８はミシンモータ、９はミシンベッド部、１０は刺繍枠、１１は加工布、１２は水平移動機構、１７は布押え棒、２０は布押え、２９は運動変換部材、３０は主軸、３１は布押え駆動カム、３６はロータリソレノイド（退避駆動手段）、３９は制御装置（運転制御手段）、６１は糸払い装置、６４はロータリソレノイド（ワイパー駆動装置）、６６はレバー、６７は連結部材、６８はワイパー部材、６８ａはフック部材、６８ｂはフック部、７１はワイパーセンサ（検知手段）を示す。

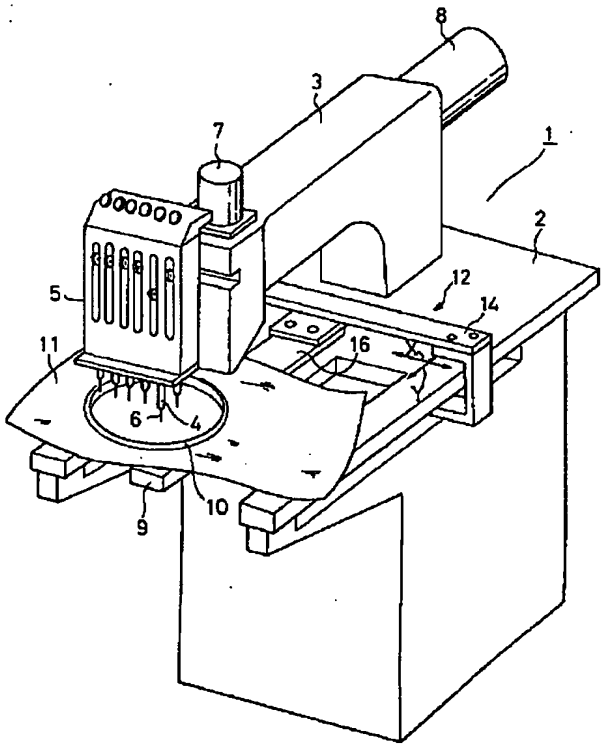
【図１】



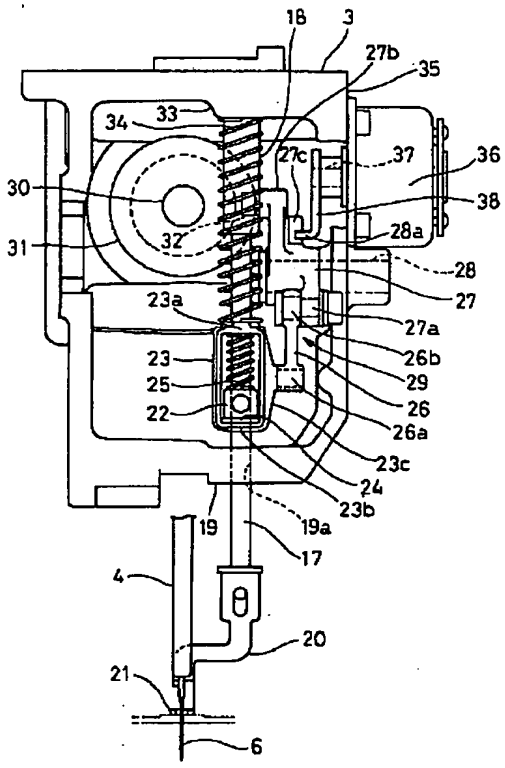
【図２】



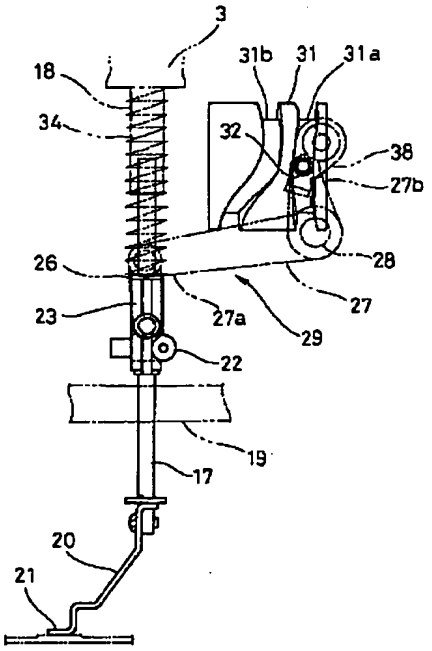
【図3】


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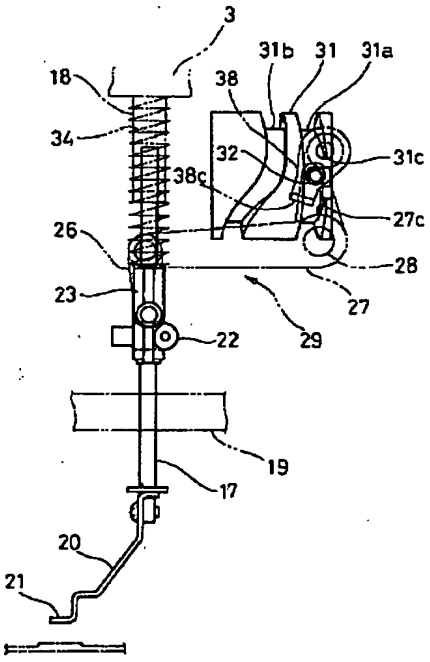
【図4】


18
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27b
35
34
33
27c
37
36
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38
31
32
28a
28
27
23a
27a
26b
23
29
25
26
22
26a
23c
24
23b
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19a
17
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21
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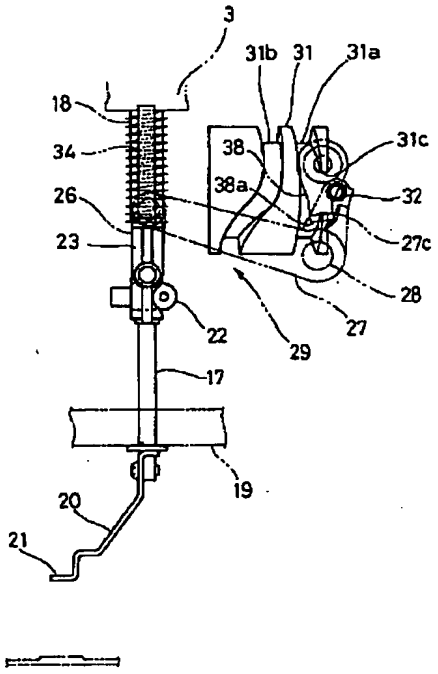
【図5】


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31b
31
31a
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32
38
27b
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28
23
27a
27
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19
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20
21

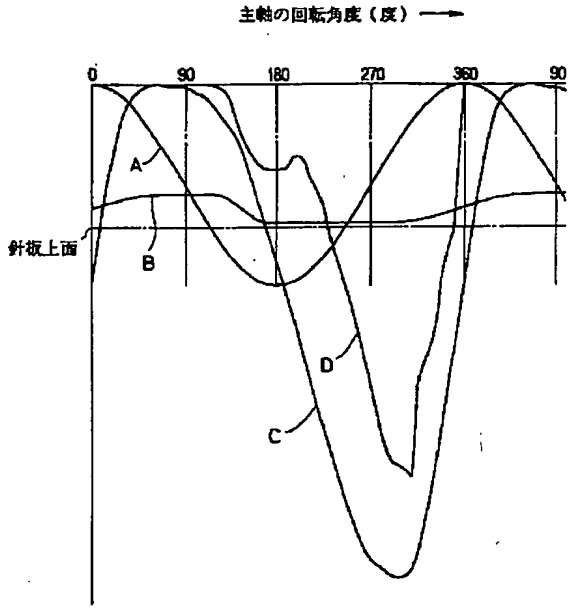
【図6】


3
18
31b
31
31a
38
34
32
31c
38c
27c
26
28
23
27
29
22
19
17
20
21

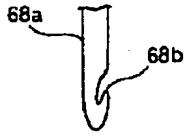
【図7】


3
31b
31
31a
18
34
38
31c
38a
32
26
23
27c
28
27
22
29
17
19
20
21

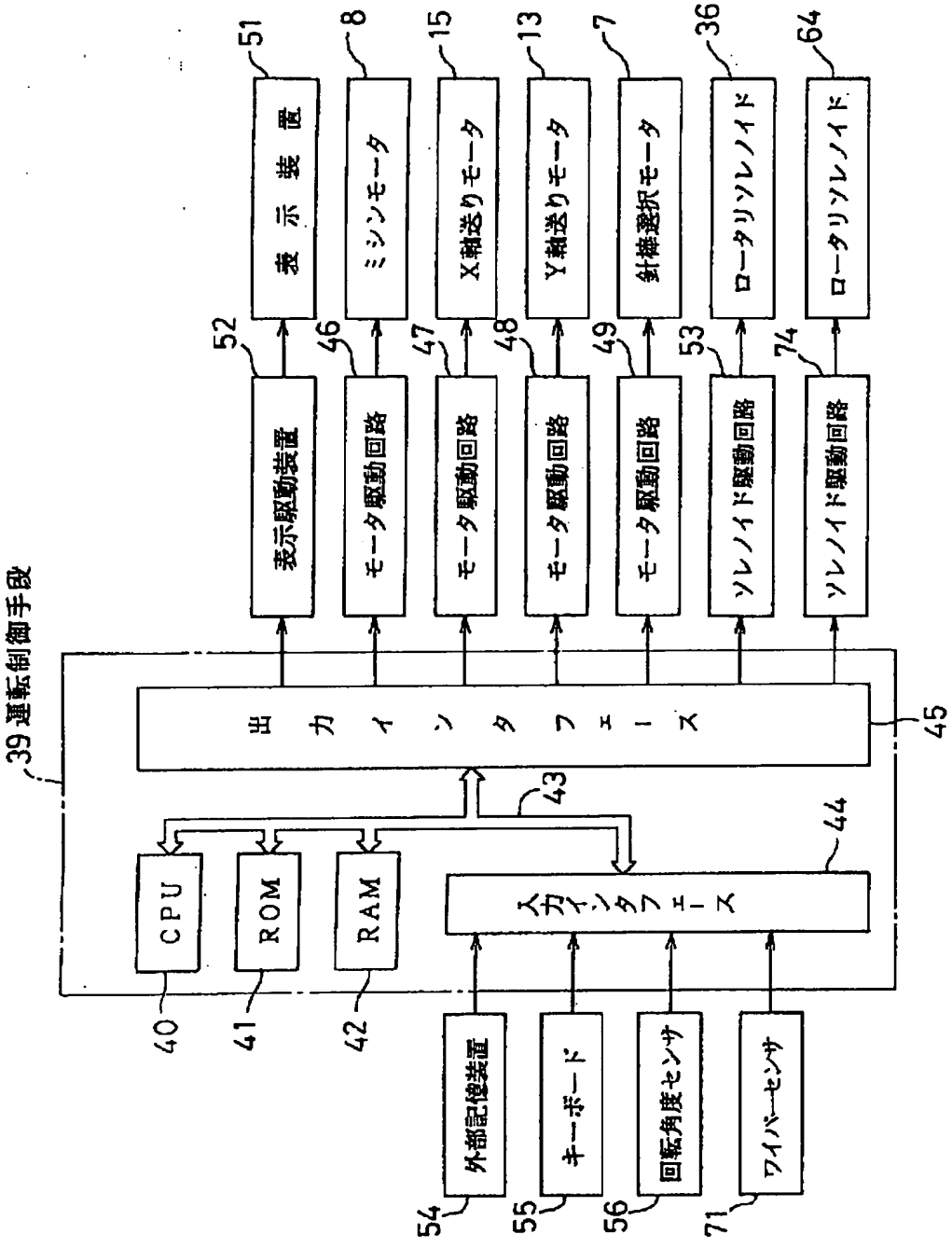
【図9】


主軸の回転角度（度）
0
90
180
270
360
90
A
針板上面
B
D
C

【図10】


68a
68b

【図8】


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